The listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

Claim 1 (previously presented): A system for measuring a condition of a turbine engine component, said condition being selected from the group consisting of strain and combination of temperature and strain of said component, said system comprising:

a first electrically non-conducting film comprising a material selected from the group consisting of dielectric materials and electrically insulating materials, said first film being disposed on a substrate of said turbine engine component without a removal of a substrate material to compensate for a thickness of said first electrically non-conducting film; and

at least a film of an electrically conducting material disposed on said first electrically non-conducting film wherein a change in a property of said at least a film of said electrically conducting material is measured, said change in said property relating to said condition of said turbine engine component, said property being electrical resistance of said film of said electrically conducting material when said condition is strain, and said property being electromotive force developed in said film of said electrically conducting material when said condition includes temperature;

wherein said first electrically non-conducting film comprises a material that has a thermal expansion coefficient selected such that said electrically non-conducting film and said at least a film of said electrically conducting material remain adhered to films and substrates adjacent thereto through at least a cycle of extreme operating temperature, and wherein a thermal strain between said first electrically non-conducting film and said substrate is positive and is maintained at less than about 0.006.

Claim 2 (canceled)

Claim 3 (original): The system according to claim 1 further comprising a second electrically non-conducting film disposed on said first electrically non-conducting film and said at least a film of an electrically conducting material, wherein said second electrically non-conducting film comprises a material that has a thermal expansion coefficient selected such that said

electrically non-conducting films and said at least a film of said electrically conducting material remain adhered to films adjacent thereto through at least a cycle of extreme operating temperature.

Claim 4 (previously presented): A system for measuring a condition of a turbine engine component, said condition being selected from the group consisting of strain and combination of strain and temperature, said system comprising:

a first electrically non-conducting film comprising a material selected from the group consisting of dielectric materials and electrically insulating materials, said first film being disposed on a substrate of said turbine engine component without a removal of a substrate material to compensate for a thickness of said first electrically non-conducting film; and

at least a film of an electrically conducting material disposed on said first electrically non-conducting film wherein a change in a property of said at least a film of said electrically conducting material is measured, said change in said property relating to said condition of said turbine engine component, said property being electrical resistance of said film of said electrically conducting material when said condition is strain, and said property being electromotive force developed in said film of said electrically conducting material when said condition includes temperature;

wherein said at least a film of an electrically conducting material extends beyond an edge of said first electrically non-conducting film to form a thermocouple junction with said substrate.

Claim 5 (previously amended): A system for measuring a temperature of a turbine engine component, said system comprising:

a first electrically non-conducting film comprising a material selected from the group consisting of dielectric materials and electrically insulating materials, said first electrically non-conducting film being disposed on a substrate of said turbine engine component without a removal of a substrate material to compensate for a thickness of said first electrically non-conducting film; and

two spaced-apart films of different electrically conducting materials disposed on said first electrically non-conducting film, said two spaced-apart films joining at one end to form a thermocouple junction, wherein a change in an electromotive force develops in said two spaced-apart films of said electrically conducting materials in response to a change in temperature, said change in said ~~property~~ relating to said ~~condition~~ temperature of said turbine engine component;

wherein a thermal strain between said first electrically non-conducting film and said substrate is positive and is maintained at less than about 0.006.

Claim 6 (original): The system of claim 5 further comprising a second electrically non-conducting film disposed on said first electrically non-conducting film and said two spaced-apart films of electrically conducting materials to sandwich said electrically conducting materials between said first and second electrically non-conducting films, wherein said second electrically non-conducting film comprises a material that has a thermal expansion coefficient selected such that said first and second electrically non-conducting films and said two spaced-apart films of said electrically conducting materials remain adhered to films adjacent thereto through at least a cycle of extreme operating temperature.

Claim 7 (original): The system of claim 5 for measuring a temperature of a turbine engine component, further comprising a third electrically non-conducting film disposed between said two spaced-apart films of electrically conducting materials.

Claim 8 (original): The system of claim 5 for measuring a temperature of a turbine engine component, wherein said first and second electrically non-conducting films comprise materials independently selected from the group consisting of AlN, BN, MgO, TiO_2, ZrO_2, La_2O_3, Cr_2O_3, ThO_2, BeO, a mixture of NiO and Al_2O_3, and mixtures thereof.

Claim 9 (original): The system of claim 5 for measuring a temperature of a turbine engine component, wherein at least one of said electrically conducting materials is selected from the group consisting of alloys of Pt-Rh, Pt-Pd, Rh-Pd, Zr-Pt-Rh, Au-Pt-Rh, Ag-Pt-Rh, Zr-Pt-Pd, Au-Pt-Pd, Au-Cr-Ru-Ni, Au-Pt, Au-Pd, W-Re, Ni-Cr, Ni-Mn-Al, Mn-Ni, Ni-Cr-Si-Mg, Ni-Si-Mg, Ni-Co, and Ni-Mo.

Claim 10 (previously amended): A turbine engine component comprising:

a substrate;

a first electrically non-conducting film comprising a material selected from the group consisting of dielectric materials and electrically insulating materials, said first electrically non-conducting film being disposed on a substrate of said turbine engine component without a removal of a substrate material to compensate for a thickness of said first electrically non-conducting film; and

at least a film of an electrically conducting material disposed on said first electrically non-conducting film;

wherein a thermal strain between said first electrically non-conducting film and said substrate is positive and is maintained at less than 0.006.

Claim 11 (original): The turbine engine component of claim 10 further comprising a second electrically non-conducting film disposed on said first electrically non-conducting material and said at least a film of an electrically conducting material, wherein said second electrically non-conducting film comprises a material that has a thermal expansion coefficient selected such that said first and second electrically non-conducting films and said at least a film of said electrically conducting material remain adhered to films adjacent thereto through at least a cycle of extreme operating temperature.

Claim 12 (previously presented): A turbine engine component comprising:

a substrate;

a first electrically non-conducting film comprising a material selected from the group consisting of dielectric materials and electrically insulating materials, said first electrically non-conducting film being disposed on a substrate of said turbine engine component without a removal of a substrate material to compensate for a thickness of said first electrically non-conducting film; and

at least a film of an electrically conducting material disposed on said first electrically non-conducting film;

wherein said at least a film of an electrically conducting material extends beyond an edge of said first electrically non-conducting film to form a thermocouple junction with said substrate, and wherein a thermal strain between said first electrically non-conducting film and said substrate is maintained at less than 0.006.

Claim 13 (original): The turbine engine component of claim 11, wherein said at least a film of an electrically conducting material comprises two spaced-apart films of different electrically conducting materials joining together at one end to form a thermocouple junction.

Claim 14 (original): The turbine engine component of claim 13, further comprising a third electrically non-conducting film disposed between said two spaced-apart films of electrically conducting materials.

Claim 15 (original): The turbine engine component of claim 11, wherein said first and second dielectric films comprise materials independently selected from the group consisting of AlN, BN, MgO, TiO_2, ZrO_2, La_2O_3, Cr_2O_3, ThO_2, BeO, a mixture of NiO and Al_2O_3, and mixtures thereof.

Claim 16 (original): The turbine engine component of claim 10, wherein said electrically conducting material is selected from the group consisting of alloys of Pt-Rh, Pt-Pd, Rh-Pd, Zr-Pt-Rh, Au-Pt-Rh, Ag-Pt-Rh, Au-Cr-Ru-Ni, Zr-Pt-Pd, Au-Pt-Pd, Au-Pt, Au-Pd, W-Re, Ni-Cr, Ni-Mn-Al, Mn, Ni, Ni-Cr-Si-Mg, Ni-Si-Mg, Ni-Co, and Ni-Mo.

Claim 17 (previously presented): A method for making a system for measuring a condition of a turbine engine component, said condition being selected from the group consisting of temperature, strain, and combination thereof, said method comprising:

depositing a first electrically non-conducting film on a substrate of said turbine engine component without removing a substrate material to compensate for a thickness of said first electrically non-conducting film, said first electrically non-conducting film comprising a material selected from the group consisting of dielectric materials and electrically insulating materials; and

depositing at least a film of an electrically conducting material on said first electrically non-conducting film, wherein a change in a property of said at least a film of said electrically conducting material is capable of being measured, said change in said property relating to said condition of said turbine engine component, said property being electrical resistance of said film of said electrically conducting material when said condition is strain, and said property being electromotive force developed in said film of said electrically conducting material when said condition includes temperature;

wherein a thermal strain between said first electrically non-conducting film and said substrate is positive and is maintained at less than 0.006.

Claim 18 (original): The method of claim 17 further comprising depositing a second electrically non-conducting film on said first dielectric material and said at least a film of an electrically conducting material to sandwich said electrically conducting material between said first and second electrically non-conducting films, wherein said second electrically non-conducting film comprises a material that has a thermal expansion coefficient selected such that said first and second electrically non-conducting films and said at least a film of said electrically conducting material remain adhered to films adjacent thereto through at least a cycle of extreme operating temperature.

Claim 19 (original): The method according to claim 17 for making a system for determining a condition of a turbine engine component; wherein each of said steps of depositing comprises delivering a mixture, which comprises a powder dispersed in a liquid medium, at a substantially constant rate through a nozzle onto a surface, said nozzle has an orifice from about 10 nm to about 250 micrometers, and said nozzle is spaced apart from said surface at a substantially constant distance.

Claim 20 (original): The method according to claim 19, further comprising heat treating a film after depositing said film and before depositing an adjacent film.

Claim 21 (original): The method according to claim 20, wherein said heat treating comprises locally heating with a beam of energy selected from laser and electron heating.

Claim 22 (original): The method according to claim 20, wherein said heat treating comprises annealing in a furnace.

Claim 23 (original): The method according to claim 17, wherein said depositing at least a film of an electrically conducting material on said first electrically non-conducting film comprises depositing two spaced-apart films of different electrically conducting materials such that said space-apart films join at one end to form a thermocouple junction.

Claim 24 (original): The method according to claim 17, further comprising depositing a third electrically non-conducting material between said two spaced-apart films of electrically conducting materials.

Claim 25 (previously amended): A method for determining a condition of a turbine engine component, said condition being selected from the group consisting of temperature, strain, and combination thereof, said method comprising:

providing a system on a surface of said turbine engine component for measuring said condition, said system comprising at least a film of an electrically conducting material disposed on an electrically non-conducting film, wherein said step of providing comprises selecting said electrically non-conducting material such that a thermal strain between said electrically non-conducting film and material of said turbine engine component is positive and is maintained at less than 0.006;

measuring a change in a property of said at least a film of said electrically conducting material; and

relating said change in said property to said condition of said turbine engine component.

Claim 26 (previously amended): A method for measuring a condition of a turbine engine component, said condition being selected from the group consisting of temperature, strain, and combination thereof, said method comprising:

providing a system on a surface of said turbine engine component for measuring said condition, said system comprising at least a film of an electrically conducting material disposed on an electrically non-conducting film, wherein said step of providing comprises selecting said electrically non-conducting material such that a thermal strain between said

electrically non-conducting film and material of said turbine engine component is positive and is maintained at less than 0.006;

measuring a change in a property of said at least a film of said electrically conducting material;

relating said measurements on said change in said property to said condition of said turbine engine component; and

transmitting said condition to a remote data collection station through a communication link.

Claim 27 (original): The method according to claim 26, wherein said property of said film is selected from the group consisting of electrical potential generated in said film and electrical resistance.

Claim 28 (original): The method according to claim 26, wherein said communication link is selected from the group consisting of telephone lines with associated modems, radio frequency transmission, microwave transmission, satellite transmission, and combinations thereof.

Claim 29 (original): The method according to claim 28, further comprising:

monitoring said condition;

detecting a condition that is outside a predetermined limit; and

performing maintenance on said turbine engine component.